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UDC 661·856·22 : 539·216·2 : 539·536

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ISO 4746 - 1977

(Reaffirmed 2006)

Indian Standard

METHOD FOR SCALE ADHESION TEST FOR OXYGEN-FREE COPPER

(ISO Title : Oxygen-Free Copper — Scale Adhesion Test)

National Foreword

This Indian Standard, which is identical with ISO 4746-1977 'Oxygen-free copper — Scale adhesion test', issued by the International Organization for Standardization (ISO), was adopted by the Bureau of Indian Standards on the recommendation of the Methods of Physical Tests Sectional Committee and approval by the Structural and Metals Division Council.

Wherever the words 'International Standard' appear, referring to this standard, they should be read as 'Indian Standard'.

Methods of Physical Test Sectional Committee, SMDC 3 [Ref : Doc : SMDC 3 (3245)]

Adopted 25 November 1987

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0 INTRODUCTION

The scale adhesion test for copper provides a means of assessing the suitability of oxygen-free copper primarily for use in electronic devices, for applications involving glass-to-metal seals, or other uses relying on the formation and presence of an adherent film of copper oxide.

1 SCOPE AND FIELD APPLICATION

This International Standard specifies a procedure for the scale adhesion testing of oxygen-free high-conductivity copper.

2 PRINCIPLE

Preparation and heating in air of a test piece, followed by rapid cooling in water. Visual examination of the cooled test piece for loss of the oxide film or blistering.

3 TEST PIECES

The test pieces shall be either of wire not less than 1 mm diameter and not more than 2 mm diameter, or of wrought flat strip of maximum cross-section 2 mm × 12 mm. Results from larger wrought or cast test pieces may be accepted if the degree of scale adhesion is satisfactory.

4 PREPARATION OF TEST PIECES

Any surface oxidation shall be removed completely.

There shall be no surface discontinuity. Inclusions, particularly of copper (I) oxide, shall also be absent. The surface of the test piece should be similar to that produced by wet grinding with 400 grades silicon carbide.

The test piece shall be degreased, cleaned by dipping in 10% (*V*/*V*) sulphuric acid in order to leave a bright clean surface, washed in cold tap water, rinsed in distilled water and dried after rinsing in alcohol or acetone. The test piece shall not be touched by hand between the cleaning and subsequent heating.

5 PROCEDURE

Heat the test piece, prepared in accordance with clause 4, in air at 850 to 875°C for 30 min and immerse it immediately in cold water.

6 REQUIREMENTS

The test piece, tested in accordance with clause 5, shall be visually examined. The black oxide film shall remain substantially unbroken and firmly adherent to the copper. Slight loss of adherence at the edges of the test piece should be neglected. No blistering or loss of oxide film shall be apparent and the coloration shall be even.

Printed at Printograph, New Delhi, India